

IN THE SPECIFICATION

Replace the paragraph beginning at page 9, line 18 and extending to page 10, line 6 with the following amended paragraph:

The effluent which comprises the higher molecular weight hydrocarbon products and hydrobromic acid is withdrawn from the second reactor 34 via line 35 and is cooled to a temperature in the range of 0 ° C. to about 100° C. in exchanger 36 and combined with vapor effluent in line 12 from hydrocarbon stripper 47, which contains feed gas and residual hydrocarbon products stripped-out by contact with the feed gas in hydrocarbon stripper 47. The combined vapor mixture is passed to a scrubber 38 and contacted with an aqueous partially-oxidized metal bromide salt solution containing metal hydroxide and/or metal oxy-bromide species, that is transported to scrubber 38 via line 41 by any suitable means, such as by pump 42. The preferred metal of the bromide salt is Cu(II), Zn(II) or Fe(III) as these are less expensive and readily oxidize at lower temperatures in the range of 120° C. to 180° C., allowing the use of fluoropolymer-lined equipment; although Co(II), Ni(II), Mn(II) or other transition-metals which form oxidizable bromide salts may be used in the process of the present invention. Alternatively, alkaline-earth metals which also form oxidizable bromide salts, such as Ca (II) or Mg(II) may be used. Any liquid hydrocarbon product condensed in scrubber 38 may be skimmed and withdrawn in line 37 and added to liquid hydrocarbon product exiting the product recovery unit 52 in line 54. Hydrobromic acid is dissolved in the aqueous solution and neutralized by the metal hydroxide and or metal oxy-bromide species to yield metal bromide salt in solution and water which is removed from the scrubber 38 via line 44.

On page 14, replace the first full paragraph with the following amended paragraph:

The effluent that contains alkyl bromides and hydrobromic acid is withdrawn from the first reactor 130 via line 131 and is partially cooled to a temperature in the range of about 150° C. to 350° C. in heat exchanger 132 before flowing to a second reactor 134. In second reactor 134, the alkyl bromides are reacted exothermically at a temperature range of from about 150° C to about 400° C, and a pressure in the range of about 1 bar to 30 bar, over a fixed bed 133 of crystalline alumino-silicate catalyst, preferably a zeolite catalyst, and most preferably a ZSM-5 zeolite catalyst. Although the zeolite catalyst is preferably used in the sodium or magnesium form, the zeolite may also be modified by ion exchange with other alkali metal cations, such as Li, K or Cs, with alkali-earth metal cations, such as Mg, Ca, Sr or Ba, or with transition metal cations, such as Ni, Mn, V, W. Other zeolite catalysts having varying pore sizes and acidities, which are synthesized by varying the alumina-to-silica ratio may be used in the second reactor 134 as will be evident to a skilled artisan. In this reactor, the alkyl bromides are oligimerized to produce a mixture of higher molecular weight hydrocarbon products and additional hydrobromic acid vapor.

Replace the paragraph beginning at page 16, line 18 and extending to page 17, line 12 with the following amended paragraph:

The residual vapor phase containing the higher molecular weight hydrocarbon products is removed as effluent from the scrubber 138 and forwarded via line 139 to dehydrator 150 to remove substantially all water from the gas stream. The water is then removed from the dehydrator 150 via line 153. The dried gas stream containing the higher molecular weight hydrocarbon products is further passed via line 151 to product recovery unit 152 to recover C₃ and C₄ as desired, but primarily the C₅+ fraction as a liquid product in line 154. Any conventional method of dehydration and liquids recovery such as solid-bed dessicant adsorption followed

by, for example, refrigerated condensation, cryogenic expansion, or circulating absorption oil, as used to process natural gas or refinery gas streams, as known to a skilled artisan, may be employed in the implementation of this invention. The residual vapor effluent from product recovery unit 152 is then split into a purge stream 157 that may be utilized as fuel for the process and a recycled residual vapor which is compressed via compressor 158. The recycled residual vapor discharged from compressor 158 is split into two fractions. A first fraction that is equal to at least 2.5 times the feed gas volume is transported via line 162, combined with the liquid bromine conveyed in line 125 and passed to heat exchanger 126 wherein the liquid bromine is vaporized and fed into first reactor 130. The second fraction which is drawn off line 162 via line 163 and is regulated by control valve 160, at a rate sufficient to dilute the alkyl bromide concentration to reactor 134 and absorb the heat of reaction such that reactor 134 is maintained at the selected operating temperature, preferably in the range of 250° C. to 350° C. in order to optimize conversion vs. selectivity and to minimize the rate of catalyst deactivation due to the deposition of carbon. Thus, the dilution provided by the recycled vapor effluent permits selectivity of bromination in the first reactor 130 to be controlled in addition to moderating the temperature in second reactor 134.

On page 19, replace the first full paragraph with the following amended paragraph:

The elemental bromine and water and any residual oxygen or nitrogen (if enriched air is utilized as the oxidant) leaving as vapor from the outlet of third reactor 117, are transported via line 127 and cooled in the second side of exchanger 141 and condenser 120 to a temperature in the range of about 0° C. to about 70° C. wherein the bromine and water are condensed and passed to three-phase separator 122. In three-phase separator 122, since liquid water has a limited solubility for bromine, on the order of about 3% by weight, any additional bromine which is condensed forms a separate, denser liquid bromine phase. The liquid bromine

phase, however, has a notably lower solubility for water, on the order of less than 0.1%. Thus, a substantially dry bromine vapor can be easily obtained by condensing liquid bromine and water, decanting water by simple physical separation and subsequently re-vaporizing liquid bromine.